Segmenting Tumors Using a ML Model
DS4002 Case Study
Hudson Noyes

Prompt

AI-powered medical imaging is a rapidly growing field aimed at leveraging machine learning's image processing capabilities to automate and standardize common medical image problems, such as segmentation, classification, and registration. In radiation oncology, deep learning models are used to segment tumors and organs at risk in treatment plan images, particularly in hard to identify cancers, such as pancreatic, prostate, cervical, and brain cancer. These technologies significantly relieve physician burden and standardize treatments across patients. We see this as an area of massive potential growth and impact, as these AI-powered models are starting to be as accurate as doctors and much quicker when making classifications.

The Deliverable

With our team already completing the analysis of a few pre trained PyTorch models, we ask the participants of this study to take our study a step further and train their own model using PyTorch for this dataset that is able to somewhat accurately segment kidney tumors from our dataset. Included is a description of how to train a model using PyTorch, as well as all necessary datasets and the means of loading and using them. Students will be expected to use a training-test split so that their model does not contain overfitting. In order for students to succeed in this case study, they must have strong data science and machine learning fundamentals, as well as some programming experience. Attached to the case study and the GitHub repo there is a document titled Training a Classifier that is there to instruct students on the technical details of training these models.